AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of all claims in the application.

Listing of Claims

1-18: (Canceled)

19. (Previously presented) An apparatus for the detection of target nucleic acids in a test sample, comprising:

a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises:

i. a single stranded nucleic acid covalently attached to said electrode via an insulator, wherein said insulator is an alkyl oligomer wherein each monomer of said alkyl oligomer is independently selected from the group consisting of: $-(CH_2)_n-$, $-(CRH)_n-$, $-(CR2)_n-$, ethylene glycol and ethylene glycol derivatives using other heteroatoms in place of oxygen; wherein n is from 1 to 16; and wherein R is selected from the group consisting of hydrogen, alkyl, alcohol, aromatic amino, amido, nitro, ethers, esters, aldehydes, sulfonyl, silicon moieties, halogens, sulfur containing moieties, phosphorous containing moieties, and

ii. a passivation agent monolayer; and

b) an AC/DC voltage source electrically connected to said first and second electrodes.

20. (Previously presented) An apparatus for the detection of target nucleic acids in a test sample, comprising:

a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises:

i. a covalently attached single stranded nucleic acid attached to said first electrode via an insulator, wherein said insulator is an alkyl oligomer wherein each monomer of said alkyl oligomer is independently selected from the group consisting of: $-(CH_2)_n-$, $-(CRH)_n-$, $-(CR2)_n-$, ethylene glycol and ethylene glycol derivatives using other heteroatoms in place of oxygen; wherein n is from 1 to 16; and wherein R is selected from the group consisting of hydrogen, alkyl, alcohol, aromatic amino, amido, nitro, ethers, esters, aldehydes, sulfonyl, silicon moieties, halogens, sulfur containing moieties, phosphorous containing moieties;

ii. a passivation agent monolayer; and
iii. a covalently attached first electron transfer moiety; and

b) an AC/DC voltage source electrically connected to said test chamber.

21. (Previously presented) An apparatus according to claim 19, 20 or 26, further comprising:

a processor coupled to said electrodes.

22. (Previously presented) An apparatus according to claim 19, 20 or 26, wherein said AC/DC voltage source is capable of delivering frequencies from between about 1 Hz to about 100 kHz.

Claims 23-25: (Canceled)

26. (Previously presented) An apparatus for the detection of target nucleic acids in a test sample, comprising:

a) a test chamber comprising a first and a second electrode, wherein said first electrode comprises:
i. a covalently attached first single stranded nucleic acid attached to said first electrode via an insulator, wherein said insulator is an alkyl oligomer wherein each monomer of said alkyl oligomer is independently selected from the group consisting of: $-(CH_2)_n-$, $-(CRH)_n-$, $-(CR2)_n-$, ethylene glycol and ethylene glycol derivatives using other heteroatoms in place of oxygen; wherein n is from 1 to 16; and wherein R is selected from the group consisting of hydrogen, alkyl, alcohol, aromatic amino, amido, nitro, ethers, esters, aldehydes, sulfonyl, silicon moieties, halogens, sulfur containing moieties, phosphorous containing moieties; and
ii. a passivation agent monolayer; and

b) a second nucleic acid covalently attached to an electron transfer moiety; and

c) an AC/DC voltage source electrically connected to said test chamber.

Claims 27-32: (Canceled)

33. (Previously presented) An apparatus according to claim 19, 20 or 26 wherein said passivation agent monolayer comprises conductive oligomers.

34. (Previously presented) An apparatus according to claim 19, 20 or 26 wherein said passivation agent monolayer comprises insulators.

35. (Previously presented) An apparatus for the detection of target nucleic acids in a test sample, comprising:

a) a test chamber comprising an array of electrodes, each electrode comprising

i. a covalently attached single stranded nucleic acid, attached to said electrodes via an insulator, wherein said insulator is an alkyl oligomer wherein each monomer of said alkyl oligomer is independently selected from the group consisting of: $-(CH_2)_n-$, $-(CRH)_n-$, $-(CR2)_n-$, ethylene glycol and ethylene glycol derivatives using other heteroatoms in place of oxygen; wherein n is from 1 to 16; and wherein R is selected from the group consisting of hydrogen, alkyl, alcohol, aromatic amino, amido, nitro, ethers, esters, aldehydes, sulfonyl, silicon moieties, halogens, sulfur containing moieties, phosphorous containing moieties; and

ii. a passivation agent monolayer; and

b) an AC/DC voltage source electrically connected to said test chamber.

Claims 36-38: (Canceled)

39. (Previously presented) An apparatus according to claim 35 wherein said passivation agent monolayer comprises conductive oligomers.

40. (Previously presented) An apparatus according to claim 35 wherein said passivation agent monolayer comprises insulators.

41. (Previously presented) An apparatus accordingly to claim 19 further comprising,

c) a second nucleic acid covalently attached to an electron transfer moiety.

42. (Previously presented) An apparatus according to claims 19, 20 or 26 wherein said passivation agent monolayer comprises alkyl chains.

43. (Previously presented) An apparatus according claim 42 wherein said alkyl chains have the formula C_nH_x, where n is 1 to 30, and x is 2(n).

44. (Previously presented) An apparatus according to claims 19, 20 or 26 wherein said passivation agent monolayer comprises terminal groups chosen from the group consisting of $-(CH_2)_n-$, $-(CRH)_n-$, $-(CR2)_n-$, ethylene glycol and ethylene glycol derivatives using other heteroatoms in place of oxygen; wherein n is from 1 to 16, and wherein R is selected from the group consisting of hydrogen, alkyl, alcohol, aromatic amino, amido, nitro, ethers, esters, aldehydes, sulfonyl, silicon moieties, halogens, sulfur containing moieties, phosphorous containing moieties, and ethylene glycol moieties.

45. (Previously presented) An apparatus according to claims 19, 20 or 26 wherein said passivation agent monolayer comprises both conductive oligomers and insulators.